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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/697,088	10/25/2000	Manabu Kitamura	16869P015200	3076

7590 06/28/2005

EXAMINER
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ART UNIT	PAPER NUMBER
2155	

DATE MAILED: 06/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/697,088	KITAMURA ET AL.	
	Examiner	Art Unit	
	Kevin Bates	2155	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 March 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *18-23,27-33,35 and 36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *18-23,27-33,35 and 36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Response to Amendment

This Office Action is in response to a communication made on March 31, 2005.

Claims 18-21, 27, 29, 31, and 35 have been amended in this application.

Clims 1-17, 24-26, 34, and 37-38 are cancelled.

Claims 18-23, 27-33, and 35-36 are pending in this application.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 18-20, 23, 27, 29-31, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gagne (6401178) in view of Schreiber (6341333).

Regarding claim 18, Gagne teaches a method of sharing data in a computer system (Column 2, lines 42 – 48), said computer system comprising a first computer, a second computer (Column 2, lines 56 – 57, where it doesn't matter if the programs are running on one device or a plurality of devices), and a storage system comprising a disk control unit (Column 4, lines 46 – 48), a first disk unit, a second disk unit, and a third disk unit (Column 2, lines 54 – 56), the method comprising:

forming a first duplex state between said first disk unit and said second disk unit (Column 2, lines 62 – 67; Column 3, lines 8 – 21), wherein said disk control unit, in response to a write request from said first computer, stores write data associated

therewith to both said first disk unit and to said second disk unit (Column 3, lines 8 – 21);

forming a simplex state, wherein said disk control unit, in response to a write request from said first computer, stores write data associated therewith only to said first disk unit (Column 2, lines 59 – 62), wherein said disk control unit, in response to a write request from said second computer stores write data associated therewith to said second disk unit (Column 8, lines 45 – 55); and

forming a second duplex state between said first disk unit and said third disk unit, whereing said disk control unit (Column 10, lines 34 – 37, the selected BCV device, which there is more than one), in response to a write request from said first computer, stores write data associated therewith to both said first disk unit and to said third disk unit (Column 2, lines 62 – 67; Column 3, lines 8 – 21),said disk control unit in response to a write request from said second computer, stores write data associated thereith to said second disk unit (Column 8, lines 45 – 55; Figure 9, elements 223, 33, and 224), but Gagne teaches that in the first duplex state wherein said disk control unit, in response to a write request from said second computer are invalid because the storage device is in the "not ready state" (Column 10, lines 38 – 41), not storing write data associated therewith to said third disk unit. Schreiber discloses a system with a plurality of storage volumes with mirror of information (Column 7, lines 52 – 67). Schreiber teaches that when a particular device that a application is trying to write to a device in the not ready state, those write operations are forwarded to one of the other mirrored copies of the volumes (Column 11, line 65 – Column 12, line 6). It would have been

obvious to one of ordinary skill in the art at the time the invention was made to use Schreiber's disclosure of forwarding write operations that are destined for Not Ready storage volumes to their mirror in Gagne's system in order to prevent disruptions in application operation (Column 11, lines 29 – 36) and so that the operations of the system in moving files or mirroring data are transparent to the user (Column 4, lines 1 – 5).

Regarding claim 19, Gagne teaches forming a simplex state subsequent to forming a second duplex state, wherein said disk control unit, in response to a write request from said first computer stores write data associated therewith only to said first disk unit, wherein said disk control unit, in response to a write request from said second computer, stores write data associated therewith to said third disk unit (Column 9, lines 39 – 51).

Regarding claim 20, Gagne teaches method of sharing data in a computer system (Column 2, lines 42 – 48), said computer system comprising a first computer, a second computer (Column 2, lines 56 – 57, where it doesn't matter if the programs are running on one device or a plurality of devices), and a storage system comprising a disk control unit (Column 4, lines 46 – 48), a first disk unit, a second disk unit, a third disk unit (Column 2, lines 54 – 56), and a fourth disk unit (Column 12, lines 36 – 44), the method comprising:

forming a duplex state between said first disk unit and said second disk unit (Column 2, lines 62 – 67; Column 3, lines 8 – 21), wherein said disk control unit, in response to a write request from said first computer, stores write data associated

therewith to both said first disk unit and to said second disk unit (Column 3, lines 8 – 21);

forming a simplex state, wherein said disk control unit, in response to a write request from said first computer, stores write data associated therewith only to said first disk unit (Column 2, lines 59 – 62); and

subsequent to said step of forming a simplex state, copying data stored in said second disk unit to said third disk unit (Column 12, lines 52 – 44) and subsequent to said copying then a disk control unit access said their disk unit in response to I/O requests from said second computer (Column 8, lines 45 – 55; Figure 9, elements 223, 33, and 224), but Gagne teaches that in the first duplex state wherein said disk control unit, in response to a write request from said second computer are invalid because the storage device is in the "not ready state" (Column 10, lines 38 – 41), not storing write data associated therewith to said third disk unit. Schreiber discloses a system with a plurality of storage volumes with mirror of information (Column 7, lines 52 – 67). Schreiber teaches that when a particular device that a application is trying to write to a device in the not ready state, those write operations are forwarded to one of the other mirrored copies of the volumes (Column 11, line 65 – Column 12, line 6). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Schreiber's disclosure of forwarding write operations that are destined for Not Ready storage volumes to their mirror in Gagne's system in order to prevent disruptions in application operation (Column 11, lines 29 – 36) and so that the operations of the

system in moving files or mirroring data are transparent to the user (Column 4, lines 1 – 5).

Regarding claim 23, Gagne teaches that said computer system further comprises a processor coupled to said storage system, and said step of copying data is performed by said processor (Column 8, lines 35 – 44).

Regarding claim 27, Gagne teaches a method of sharing data in a computer system (Column 2, lines 42 – 48), said computer system comprising a first computer, a second computer, a first storage system coupled to said first computer and comprising a first disk unit and a first disk control unit, and a second storage system coupled to said second computer and comprising a second disk unit, a third disk unit, a fourth disk unit, and a second disk controller unit (Column 2, lines 56 – 57, where it doesn't matter if the programs are running on one device or a plurality of devices; Column 2, lines 54 – 57; Column 12, lines 36 – 44), wherein said first disk control unit and said second disk control unit are coupled via a network (Column 5, lines 5 – 7), the method comprising steps of:

copying data stored in said first disk unit to said second disk unit via said network;

forming a duplex state between said first disk unit and said second disk unit, wherein said first disk control unit (Column 2, lines 62 – 67; Column 3, lines 8 – 21), in response to a write request from said first computer, stores write data associated therewith to both said first disk unit and to said second disk unit (Column 3, lines 8 – 21);

forming a simplex state, wherein said first disk control unit, in response to a write request from said first computer, stores write data associated therewith only to said first disk unit; and

subsequent to said step of forming a simplex state (Column 2, lines 59 – 62), copying data stored in said second disk unit to said third disk unit (Column 12, lines 52 – 44) and subsequent to said copying then a disk control unit access said their disk unit in response to I/O requests from said second computer (Column 8, lines 45 – 55; Figure 9, elements 223, 33, and 224), but Gagne teaches that in the first duplex state wherein said disk control unit, in response to a write request from said second computer are invalid because the storage device is in the "not ready state" (Column 10, lines 38 – 41), not storing write data associated therewith to said third disk unit. Schreiber discloses a system with a plurality of storage volumes with mirror of information (Column 7, lines 52 – 67). Schreiber teaches that when a particular device that a application is trying to write to a device in the not ready state, those write operations are forwarded to one of the other mirrored copies of the volumes (Column 11, line 65 – Column 12, line 6). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Schreiber's disclosure of forwarding write operations that are destined for Not Ready storage volumes to their mirror in Gagne's system in order to prevent disruptions in application operation (Column 11, lines 29 – 36) and so that the operations of the system in moving files or mirroring data are transparent to the user (Column 4, lines 1 – 5).

Regarding claim 29, Gagne teaches a storage system comprising:

a disk control unit (Column 4, lines 46 – 48); and

a plurality of disk units (Column 2, lines 54 – 56),

wherein said disk control unit is operable to form a duplex state between a first disk unit and a second disk unit (Column 2, lines 62 – 67; Column 3, lines 8 – 21), wherein data associated with a write request from a first computer is stored to both said first disk unit and to said second disk unit (Column 3, lines 8 – 21),

wherein said disk control unit is further operable to form a simplex state between said first disk unit and said second disk unit, wherein data associated with a write request from said first computer is stored only to said first disk unit (Column 2, lines 59 – 62),

wherein during said simplex state, data stored in said second disk unit is copied to a third disk unit (Column 12, lines 52 – 44) and said second disk unit is accessed to service an I/O requests from said second computer (Column 8, lines 45 – 55; Figure 9, elements 223, 33, and 224), but Gagne teaches that in the first duplex state wherein said disk control unit, in response to a write request from said second computer are invalid because the storage device is in the "not ready state" (Column 10, lines 38 – 41), not storing write data associated therewith to said third disk unit. Schreiber discloses a system with a plurality of storage volumes with mirror of information (Column 7, lines 52 – 67). Schreiber teaches that when a particular device that a application is trying to write to a device in the not ready state, those write operations are forwarded to one of the other mirrored copies of the volumes (Column 11, line 65 – Column 12, line 6). It would have been obvious to one of ordinary skill in the art at the time the invention was

made to use Schreiber's disclosure of forwarding write operations that are destined for Not Ready storage volumes to their mirror in Gagne's system in order to prevent disruptions in application operation (Column 11, lines 29 – 36) and so that the operations of the system in moving files or mirroring data are transparent to the user (Column 4, lines 1 – 5).

Regarding claim 30, Gagne teaches that subsequent to said step of re-mapping, forming a duplex state between said first disk unit and said third disk unit (Column 2, lines 54 – 62, where when one disk unit is split from the first disk unit, the other can be established as a mirror).

Regarding claim 31, Gagne teaches a storage system comprising:

a disk control unit (Column 4, lines 46 – 48); and

a plurality of disk units (Column 2, lines 54 – 56),

wherein said disk control unit is operable to form a duplex state between a first disk unit and a second disk unit (Column 2, lines 62 – 67; Column 3, lines 8 – 21), wherein data associated with a write request from a first computer is stored to both said first disk unit and to said second disk unit (Column 3, lines 8 – 21),

wherein said disk control unit is further operable to form a simplex state, wherein data associated with a write request from said first computer is stored only to said first disk unit,

wherein during said simplex state (Column 2, lines 59 – 62), data stored in said second disk unit is copied to a third disk unit (Column 12, lines 52 – 44) and subsequent to said copying, data associated with a write request from said second computer is

stored to said their disk unit (Column 8, lines 45 – 55; Figure 9, elements 223, 33, and 224), but Gagne teaches that in the first duplex state wherein said disk control unit, in response to a write request from said second computer are invalid because the storage device is in the "not ready state" (Column 10, lines 38 – 41), not storing write data associated therewith to said third disk unit. Schreiber discloses a system with a plurality of storage volumes with mirror of information (Column 7, lines 52 – 67). Schreiber teaches that when a particular device that a application is trying to write to a device in the not ready state, those write operations are forwarded to one of the other mirrored copies of the volumes (Column 11, line 65 – Column 12, line 6). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Schreiber's disclosure of forwarding write operations that are destined for Not Ready storage volumes to their mirror in Gagne's system in order to prevent disruptions in application operation (Column 11, lines 29 – 36) and so that the operations of the system in moving files or mirroring data are transparent to the user (Column 4, lines 1 – 5).

Regarding claim 35, Gagne teaches a storage system comprising:

a disk control unit (Column 4, lines 46 – 48);

a plurality of disk units (Column 2, lines 54 – 56); and

a network connecting at least some of said disk units (Figure 1, element 36),

said disk control unit being operable to copy data stored in a first disk unit to a second disk unit via said network,

said disk control unit being operable to form a duplex state between said first disk unit and said second disk unit, wherein data associated with a write request from a first computer is stored to both said first disk unit and to said second disk unit (Column 2, lines 62 – 67; Column 3, lines 8 – 21),

said disk control unit being further operable to form a simplex state, wherein data associated with a write request from said first computer is stored only to said first disk unit,

wherein during said simplex state (Column 2, lines 59 – 62), data stored in said second disk unit is copied to a third disk unit (Column 12, lines 52 – 44) and subsequent to said copying, said second computer accesses said third disk unit (Column 8, lines 45 – 55; Figure 9, elements 223, 33, and 224), but Gagne teaches that in the first duplex state wherein said disk control unit, in response to a write request from said second computer are invalid because the storage device is in the "not ready state" (Column 10, lines 38 – 41), not storing write data associated therewith to said third disk unit. Schreiber discloses a system with a plurality of storage volumes with mirror of information (Column 7, lines 52 – 67). Schreiber teaches that when a particular device that a application is trying to write to a device in the not ready state, those write operations are forwarded to one of the other mirrored copies of the volumes (Column 11, line 65 – Column 12, line 6). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Schreiber's disclosure of forwarding write operations that are destined for Not Ready storage volumes to their mirror in Gagne's system in order to prevent disruptions in application operation (Column 11,

lines 29 – 36) and so that the operations of the system in moving files or mirroring data are transparent to the user (Column 4, lines 1 – 5).

Claims 21-22, 28, 32-33, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gagne in view of Schreiber as applied to claims 18-20, 23, 27, 29-31, and 35 above, and further in view of Misiani (5758125).

Regarding claim 21, 28, 32, and 36, Gagne does not explicitly indicate the step of copying the contents of the second memory unit to the third memory unit includes a step of converting a first data format stored in the second memory unit for use by the first computer into a second data format for use by the second computer. Misinai teaches a secondary storage controller that copies the contents of the second memory unit to the third memory unit includes a step of converting a first data format stored in the second memory unit for use by the first computer into a second data format for use by the second computer (Column 2, lines 12 – 19). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Misinai's storage system controller to allow heterogeneous computer systems to share memory in the storage subsystem (Column 1, lines 48 – 55).

Regarding claims 22 and 33, the combined invention of Gagne in view of Misinai from the rejection to claim 21, includes the step of converting data from the first data format to the second data format is based on interfaces among the first computer, the second computer and the data storage subsystem (Column 2, lines 21 – 40, Misinai).

Response to Arguments

Applicant's arguments with respect to claims 18-23, 27-33, and 35-36 have been considered but are moot in view of the new ground(s) of rejection.

Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U. S. Patent No. 6131148 issued to West, because it discloses creating a duplex state between logical volumes.

U. S. Patent No. 6529944 issued to LeCrone, because it discloses cascading mirrors in a redundant storage system.

U. S. Patent No. 6253295 issued to Beal, because it discloses duplexing a plurality of storage volumes.

U. S. Patent No. 6631442 issued to Blumenau, because it discloses mirroring data and routing storage requests based on disk identifiers and labels.

U. S. Patent No. 6324654 issued to Wahl, because it discloses having multiple storage devices, and duplexing some of them at times.

U. S. Patent No. 634133 issued to Schreiber, because it discloses establishing mirrors in a plurality of storage volumes, and transparently forwarding write operations.

U. S. Patent No. 6101497 issued to Ofek, because it discloses establishing and splitting mirrors.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Bates whose telephone number is (571) 272-3980. The examiner can normally be reached on 8 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Saleh Najjar can be reached on (571) 272-4006. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KB

KB
June 24, 2005

SALEH NAJJAR
PRIMARY EXAMINER